

REMARKS**A. Claims 1 and 26-31 are not obvious in light of the references cited by the Office Action.**

Claims 1 and 26-31 were rejected under 35 U.S.C. § 103(a) as being obvious in view of various combinations of U.S. Patent No. 5,613,359 to Zahn, et al. (the "Zahn" reference), in view of U.S. Patent No. 6,233,927 to Hirota et al. (the "Hirota" reference), U.S. Patent No. 6,192,675 to Hirota et al (the "Hirota II" reference), U.S. Patent No. 6,023,929 to Ma (the "Ma" reference), U.S. Patent No. 6,318,073 to Boegner et al. (the "Boegner" reference), and U.S. Patent No. 6,293,096 to Khair et al. (the "Khair" reference). Applicants respectfully traverse.

1. Any combination of the Zahn reference and the Hirota reference does not result in the Applicants' invention as amended.

The Office Action relies on the Zahn reference to disclose an adsorber 6. Amended claims 1 and 26 both require a "NOx adsorber." The Zahn reference discloses on column 1, lines 45-48 that the adsorber 6 disclosed in the Zahn reference is to adsorb hydrocarbons. In fact, a NOx adsorber would render the device disclosed in the Zahn reference partially inoperable for its intended function. In re Ohsumi, 21 U.S.P.Q. 2d 1020, 1025 (Bd. Pat. App. & Interf. 1991) (not obvious to make a substitution of a component in a reference if the substitution is antithetical to the purpose described in that reference for that component). Thus, any combination of the Zahn reference with the Hirota reference does not result in the Applicants' invention as claimed.

Further reasons exist showing that a combination of the Zahn reference with the Hirota

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reference would not result in the Applicants' claimed invention. Claim 1 specifically requires a "catalytic soot filter having a soot filter input operatively coupled to the sulfur trap output." Claim 26 specifically requires a "catalytic soot filter having a soot filter input operatively coupled to the engine exhaust." The trapping filter 7 disclosed in the Hirota reference is very different than the "catalytic soot filter" required by claims 1 and 26. The trapping filter 7 disclosed in the Hirota reference is not catalytic. It is a physical mesh particulate filter (see column 3, lines 46-51). As disclosed in Applicants' specification on page 10, lines 1-2, "the catalytic soot filter also acts as a flow-through oxidation catalyst by the addition of precious metal catalysts." Thus, modifying the system disclosed in the Zahn reference with the trapping filter disclosed in the Hirota reference would not result in Applicants' claimed "catalytic soot filter" because of the non-catalytic nature of the trapping filter disclosed in the Hirota reference.

Yet even further reasons support the conclusion that the combination of the Zahn and Hirota references does not render obvious Applicants' claimed invention. For example, claims 1 and 26 specifically require a "sulfur trap." Trapping filter 7 disclosed in the Hirota reference is not a sulfur trap. Trapping filter 7 traps particles and burns them. Some of the particles have SO_x contained within them, but the intended function of the trapping element is to trap particulate matter not sulfur. Sulfur present in the exhaust gas that is not contained within the particulate matter still passes through. The term "sulfur trap," as commonly known by those skilled in the art, refers to a device that traps actual gas through a catalytic chemical reaction without using particulate matter. *See, U.S. Patent No. 6,482,377 to Bartley et al.* Unlike the trapping filter 7 disclosed in the Hirota reference, Applicants' invention traps

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sulfur whether in a gas or particulate form. Thus, combining the Hirota reference with the Zahn reference does not render Applicants' claims 1 and 26 obvious because the trapping filter of the Hirota reference is not a "sulfur trap" within the meaning of that term in the present claims.

2. There is no suggestion in the Zahn or the Hirota references to modify either reference or combine the references to arrive at the Applicants' invention.

There is no suggestion in the Zahn reference to modify the reference so that a NOx adsorber may be used. The Zahn reference teaches using an adsorber that adsorbs hydrocarbons. Furthermore, there is no teaching in any of the references of record that hydrocarbon adsorbers and NOx adsorbers are interchangeable. Additionally, there is no suggestion in the Zahn reference to modify the reference by adding a soot filter. The standard is not obvious to try. Jones v. Hardy, 220 U.S.P.Q. 1021, 1026 (Fed. Cir. 1986). Thus, the Zahn reference actually teaches away from Applicants' invention.

Moreover, there is no suggestion in the Hirota reference that the trapping filter 7 disclosed in the Hirota reference can be used with the system disclosed in the Zahn reference. The Zahn reference discloses an adsorber 6 within bypass conduit 5. The trapping filter 7 disclosed in the Hirota reference, if used with the system disclosed in the Zahn reference, would poison the adsorber 6 of the Zahn reference because of the large release of SOx gas at one time. Thus, there is no suggestion to combine the references cited by the Office Action.

Claims 27-31 depend from claim 26, and therefore, include all of the limitations of claim 26. It is therefore respectfully submitted that claims 27-31 are allowable over the

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references of record for at least the reasons set forth above with respect to independent claim 26.

B. Claims 2 and 8 are not anticipated by U.S. Patent No. 6,318,073 to Boegner et al. (the "Boegner" reference).

Claims 2, 3 and 8 were rejected by the Office Action under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,318,073 to Boegner et al. (the "Boegner" reference). Anticipation requires that the reference cited by the Office Action disclose each and every limitation of the claim. Claims 3 and 4 have been Cancelled and claim 2 has been amended. Claim 2 as amended specifically requires "a catalytic soot filter having a soot filter input operatively coupled to the sulfur trap output and having a soot filter output operatively coupled to the valve system input." The Boegner reference does not teach the use of a catalytic soot filter. Thus, the Boegner reference cannot anticipate Applicants' invention as claimed in independent claim 2.

Moreover, no combination of the Boegner reference with any of the references cited by the Examiner renders amended claim 2 obvious because no reference cited by Examiner teaches a catalytic soot filter as discussed hereinabove under section A.I.

Dependent claim 8 depends from claim 2 and therefore includes all of the limitations of independent claim 2. It is therefore respectfully submitted that claim 8 is allowable over the references of record for at least the same reasons set forth above with respect to independent claim 2.

Claims 4-7 and 9-10 were rejected under 35 U.S.C. § 103(a) as being obvious in view of various combinations of the Boegner reference with U.S. Patent No. 6,233,927 to Hirota et

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al. (the "Hirota" reference), U.S. Patent No. 5,613,359 to Zahn et al. (the "Zahn" reference), U.S. Patent No. 6,192,675 to Hirota et al. (the "Hirota" reference), U.S. Patent No. 6,023,929 to Ma (the "Ma" reference), U.S. Patent No. 6,293,096 to Khair et al. (the "Khair" reference). Claim 4 has been Cancelled. Claims 5-7 and 9-10 depend from claim 2 and therefore include all of the limitations of independent claim 2. It is therefore respectfully submitted that claims 5-7 and 9-10 are allowable over the references of record for at least the same reasons set forth above with respect to independent claim 2.

C. Claims 11-12, 16, 19-20 and 23 are not obvious in light of the references cited by the Examiner.

Claims 11-12, 16, 19-20 and 23 were rejected by the Examiner as being obvious in view of the combination of the Boegner reference in view of U.S. Patent No. 6,318,073 to Minami (the "Minami" reference). Preliminarily, it should be noted that the Minami reference is of the type that may be overcome under C.F.R. § 1.131 and Applicants reserve this right. Moreover, there is no suggestion to modify the invention disclosed in the Boegner reference in view of the Minami reference.

The Minami reference teaches away from the Applicants' invention as recited in claims 11 and 19. Claim 11 recites "a catalytic soot filter having a soot filter input operatively coupled to the valve system output." Moreover, claim 11 recites "an adsorber having an adsorber input operatively coupled to the soot filter output," and "a bypass output operatively coupled to the adsorber output." The Minami reference teaches placing the DPF 21 and NOx occluding/reducing catalyst (adsorber) 22 downstream of the bypass passageway 15. This is opposite to the language as claimed above. The Minami reference therefore

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teaches away from placing the DPF 21 and adsorber 22 upstream of the bypass pathway outlet as required by Applicants' claim 11.

Moreover, the DPF 21 disclosed in the Minami reference is not catalytic (it is a physical particulate filter). Thus, any modification of the Boegner reference with the Minami reference fails to teach the Applicants' invention as claimed in claim 11.

Similarly, claim 19 recites "an adsorber having an adsorber input operatively coupled to the first valve output and having an adsorber output," a "bypass pathway having a bypass input operatively coupled to the second valve output and having a bypass output," and "a catalytic soot filter having a soot filter input operatively coupled to the adsorber output and the bypass output and having a soot filter output." The Minami reference teaches that the adsorber 22 should be placed downstream of the bypass pathway 15 output, not upstream the bypass pathway output, as required by Applicants' claims. Moreover, the Minami reference uses the bypass around the oxidation catalyst 20 (not the adsorber 22) during adsorber regeneration cycles to allow the hydrocarbons to reach the NO_x adsorber 22 to convert NO_x to N₂. Conversely, Applicants' invention described in claim 19 places the adsorber upstream of the bypass outlet to reduce fuel penalty during a regeneration cycle. Thus, the Minami reference teaches away from the invention recited in claim 19.

Dependent claims 12, 16, 20 and 23 depend from independent claims 11 and 19, and therefore include all of the limitations of independent claims 11 and 19. It is therefore respectfully submitted that dependent claims 12, 16, 20 and 23 are allowable over the references of record for at least the same reasons set forth above with respect to independent claims 11 and 19.

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Claims 13-15, 17-18, 20-21, and 24-25 were rejected under 35 U.S.C. § 103(a) as being obvious in view of various combinations of the Boegner reference with U.S. Patent No. 6,484,495 to Minami et al. (the "Minami" reference), U.S. Patent No. 5,613,359 to Zahn et al. (the "Zahn" reference), U.S. Patent No. 6,233,927 to Hirota et al. (the "Hirota" reference), U.S. Patent No. 6,023,929 to Ma (the "Ma" reference), U.S. Patent No. 6,293,096 to Khair et al. (the "Khair" reference). Dependent claims 13-15, 17-18, 20-21, and 24-25 depend from independent claims 11 and 19, and therefore include all of the limitations of independent claims 11 and 19. It is therefore respectfully submitted that dependent claims 13-15, 17-18, 20-21, and 24-25 are allowable over the references of record for at least the same reasons set forth above with respect to independent claims 11 and 19.

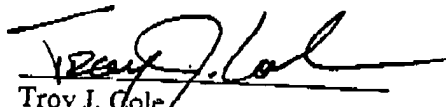
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Applicants therefore believe that all claims are in condition for allowance and respectively requested to pass issue. Should it facilitate allowance of the application, the Examiner is invited to telephone the undersigned attorney.

No additional fees are believed to be necessary, however, should any fees be deemed required, the Commissioner is authorized to charge such fees to Deposit Account No. 23-3030, but is not to include payment of issue fees.

Respectfully submitted:



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Applicant Rahul Mittal

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